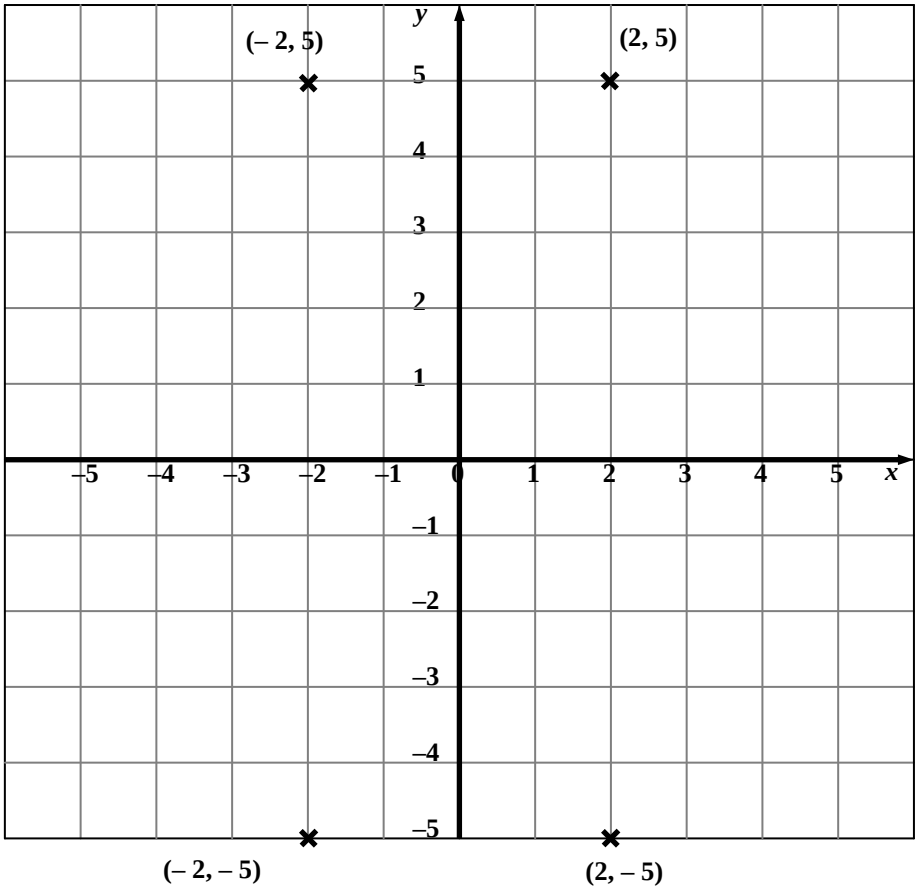
In this activity you will explore what graphs of the type $y = mx + c$ look like with different values of m and c.

Information sheet

A Coordinates

The position of a point on a graph is given by two coordinates, x and y, where x is the horizontal coordinate and y is the vertical coordinate.

For example (2, 5) is the point with x coordinate 2 and y coordinate 5. This point is show on the graph below. This also shows the positions of the points (2, – 5), (– 2, 5) and (– 2, – 5)



B Graphs of equations of the form $y = x + c$

Equations involving x and y represent straight lines or curves.

To find the position of a line or curve, draw up a table of values that satisfy the equation and use these to plot points on a graph. Joining the points gives the line or curve.

Equations of the form $y = mx + c$, where m and c are positive or negative constants, always give **straight lines**.

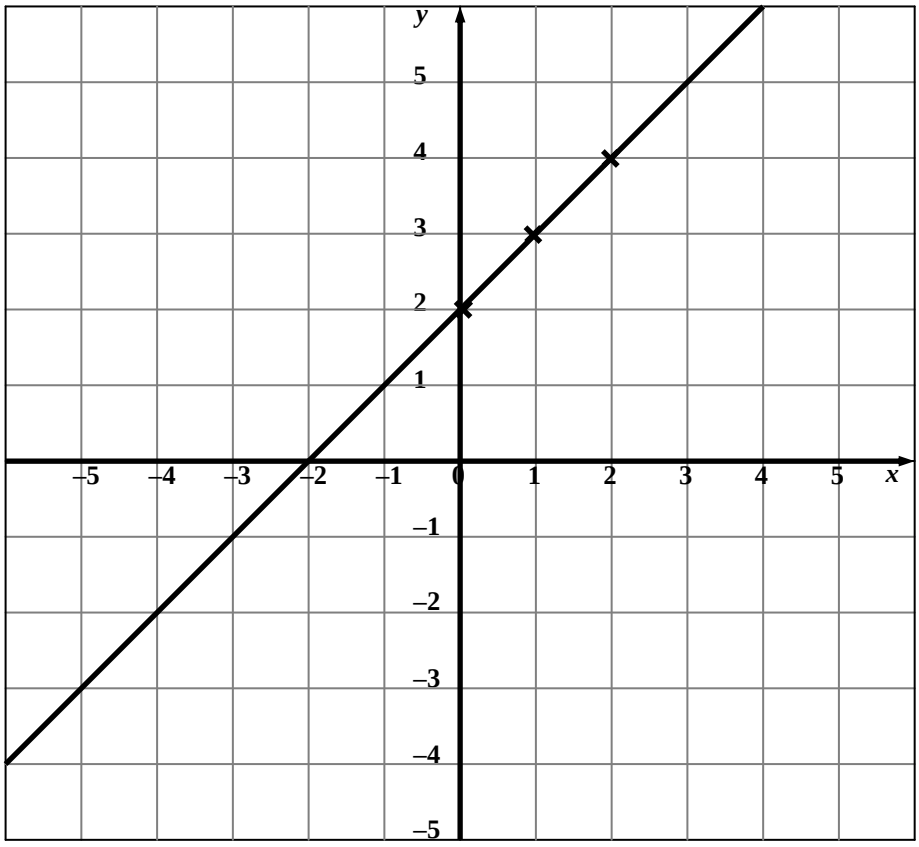
Example $y = x + 2$

To draw the line:

- Choose 3 values for *x*.
- Work out the corresponding values for *y*.
- Plot the points on a graph.
- Join the points with a straight line.
- Label the line with its equation.

For $y = x + 2$

x	0	1	2
y	2	3	4



$y = x + 2$

Think about

Why don't we just plot 2 points?

Try these

Use the equations to complete the tables below.
Draw the lines on the graph above. Remember to label each line.

$y = x + 1$

x	0	1	2
y			

$y = x + 3$

x	0	1	2
y			

$y = x - 1$

x	1	2	3
y			

$y = x - 2$

x	2	3	4
y			

Think about

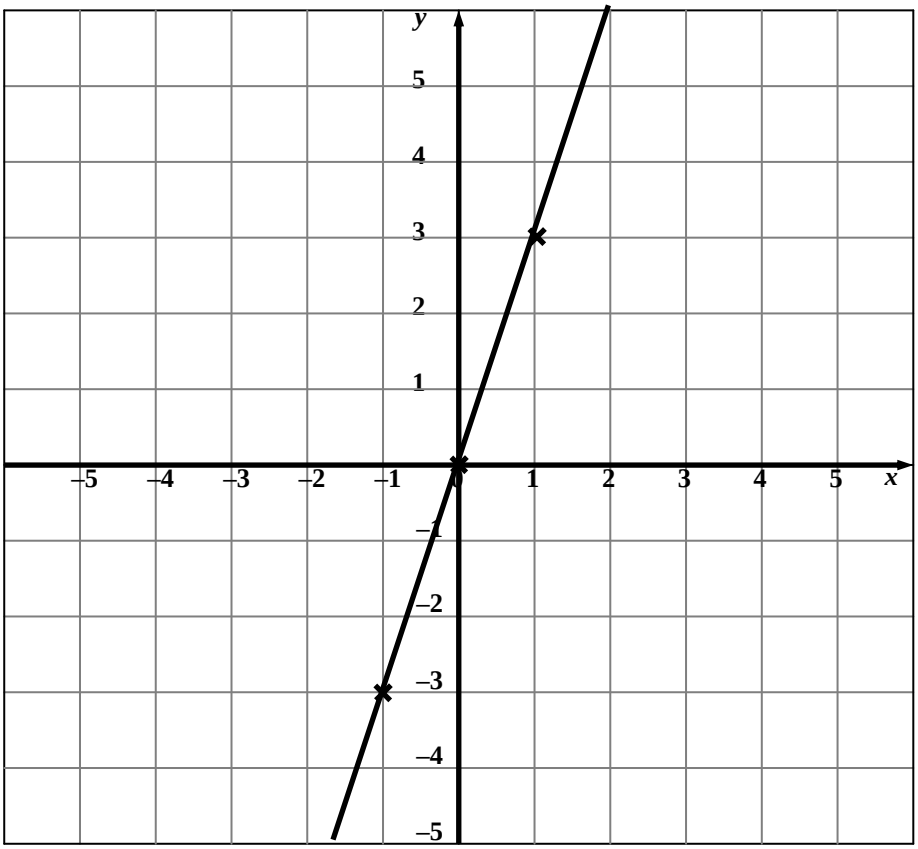
What happens to each graph as the value of c, the constant, changes?

C Graphs of equations of the form $y = mx$

Example

$y = 3x$

x	-1	0	1
y	-3	0	3



$y = 3x$

Try these

Use the equations to complete the tables below.
Draw the lines on the graph above. Remember to label each line.

$y = 2x$

x	0	1	2
y			

$y = -2x$

x	0	1	2
y			

$y = -3x$

x	-1	0	1
y			

$y = 0.5x$

x	0	2	4
y			

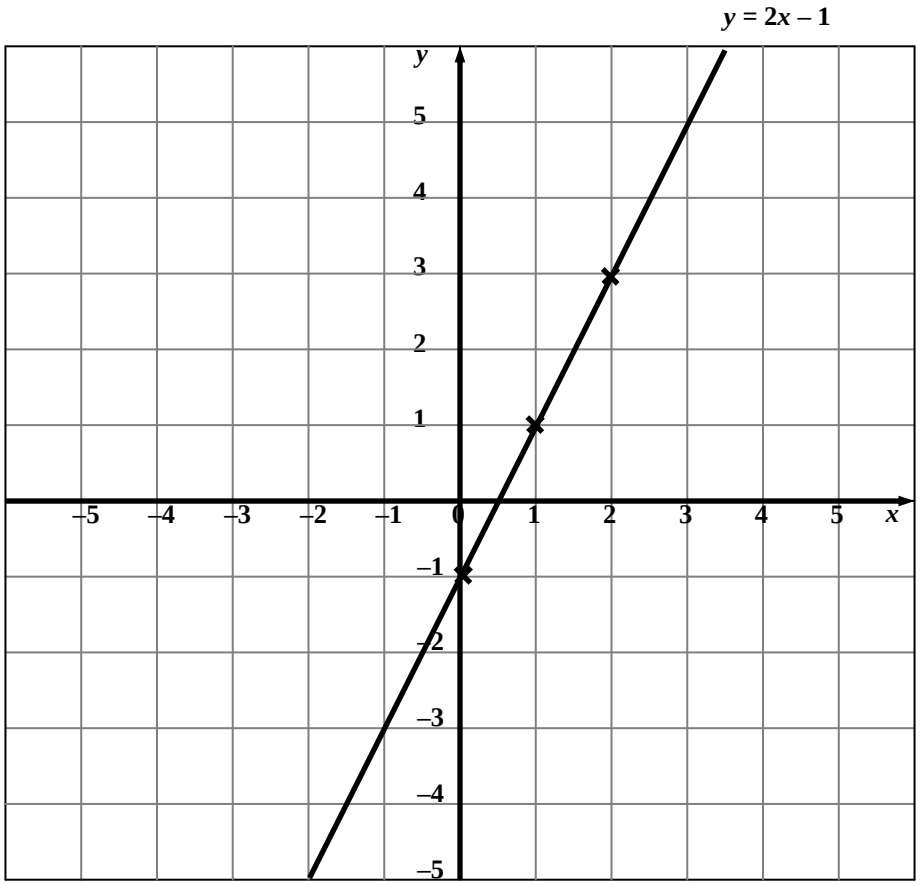
Think about

What happens to each graph as the value of m, called the gradient, changes?

D Graphs of equations of the form $y = mx + c$

Example $y = 2x - 1$

x	0	1	2
y	– 1	1	3



Note that you could find the position of a line using just two points, but it is advisable to plot at least one more point as a check.

Try these

Use the equations to complete the tables below.
Draw the lines on the graph above. Remember to label each line.

$y = 2x + 1$

x	0	1	2
y			

$y = 2x - 3$

x	0	1	2
y			

$y = 3x - 1$

x	0	1	2
y			

$y = 0.5x - 1$

x	0	2	4
y			

Reflect on your work

Explain to your partner what the values m and c stand for in the equation $y = mx + c$.

For example, in the equation $y = 2x + 1$, what do the '2' and the '1' tell you about the graph?